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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/563,056

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David J. Combes

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EXAMINER

IGYARTO, CAROLYN

ART UNIT

PAPER NUMBER

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DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/563,056	<b>Applicant(s)</b> COMBES ET AL.	
	<b>Examiner</b> CAROLYN IGYARTO	<b>Art Unit</b> 2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

1. The amendment filed on 8 April 2008 was accepted and entered. Accordingly, claim 1 has been amended. No new claims have been added. No claims have been cancelled. Thus, claims 1-23 are currently pending in this application.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 1-23 have been considered but are moot in view of the new ground(s) of rejection.

### ***Drawings***

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the mounting means for mounting said supporting frame on a substrate and for providing thermal isolation between said substrate and said supporting frame must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet,

and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Mounting means for mounting said support frame on a substrate and for providing thermal isolation between said substrate and said supporting frame does not seem to be originally disclosed. Applicant points to page 5, lines 24-28 of the original specification to support this limitation. However, this area of the specification does not support this limitation. Rather, locating the resonator

element on a suspended portion of the supporting frame to provide good thermal isolation from the underlying substrate is supported. This does not support a mounting means nor does it support thermal isolation between the substrate and the supporting frame.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-4, 8-14, 16-17, 19-20, and 23 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Vig, John R. (US 5,686,779), herein after referred to as Vig.

8. With respect to **claim 1**, Vig teaches a device for detecting infrared radiation comprising (Abstract; col. 2, lines 16-21 and 40-47):

a resonator element (1) fixably attached to a supporting frame (2) (Abstract; Fig. 4);

an electrical oscillator for driving said resonator element into resonance (col. 3, lines 21-23), wherein the supporting frame is adapted to absorb infrared radiation received by the device thereby altering a resonant property of said resonator element (col. 1, lines 15-16 and 34-36; Also, it has been

held that the recitation that an element is “adapted to” perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchison, 69 USPQ 138. (CCPA 1946)); and

mounting means for mounting said supporting frame on a substrate and for providing thermal isolation between said substrate and said supporting frame (Fig. 4; col. 2, lines 29-33 and 66-68; col. 3, lines 1-3; col. 9, lines 4-5).

In the alternative, if it is held that Vig does not teach a separate mounting means different from the supporting frame itself for mounting said supporting frame on a substrate and for providing thermal isolation between said substrate and said supporting frame. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a separate mounting means different from the supporting frame itself for mounting said supporting frame on a substrate and for providing thermal isolation between said substrate and said supporting frame, since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *Nerwin v. Erlichman*, 168 USPQ 177, 179.

9. With respect to **claim 2**, Vig teaches the supporting frame comprises a suspended portion spaced apart from the underlying substrate of the device, the resonator element being fixably attached to the suspended portion (Fig. 4).

10. With respect to **claim 3**, Vig teaches the suspended portion is spaced apart from the underlying substrate by a distance that is sufficient to form a resonant absorption structure for radiation having a wavelength within the infrared detection band of the device (Fig. 4; col. 2, lines 16-21 and 40-47).

11. With respect to **claim 4**, Vig teaches the suspended portion is suspended from the underlying substrate on at least one leg (Fig. 4). In the alternative, if it is held that Vig does not teach a separate leg. It would have been obvious to one of ordinary skill in the art at the time the invention was made have a separate leg, since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *Nerwin v. Erlichman*, 168 USPQ 177, 179.

12. With respect to **claim 8**, Vig teaches a resonant frequency of the resonator element is arranged to vary when infrared radiation is absorbed by the device (Abstract; col. 1, lines 15-16 and 34-36; col. 2, lines 16-21 and 40-47).

13. With respect to **claim 9**, Vig teaches oscillation means to drive the resonator element into resonance (col. 3, lines 21-23).

14. With respect to **claim 10**, Vig teaches the oscillation means is arranged to electrostatically drive the resonator element (col. 3, lines 16-23).

Art Unit: 2884

15. With respect to **claim 11**, Vig teaches the resonator element is fixably attached to the supporting frame at two or more points (Fig. 4).

16. With respect to **claim 12**, Vig teaches the resonator element comprises an elongate flexible beam (Fig. 4; col. 5, lines 29-31).

17. With respect to **claim 13**, Vig teaches the supporting frame comprises a layer of material having an aperture defined therein (Fig. 4).

18. With respect to **claim 14**, Vig teaches the resonator element comprises an elongate flexible beam, said elongate flexible beam being arranged to lie across the aperture defined in the layer of material (Fig. 4; col. 5, lines 29-31).

19. With respect to **claim 16**, Vig teaches a plurality of detection elements, each detection element comprising a resonator element fixably attached to a supporting frame (col. 5, lines 14-25).

20. With respect to **claim 17**, Vig teaches each detection element has an axis of symmetry (Fig. 4).

21. With respect to **claim 19**, Vig teaches an array of detection elements is provided (col. 5, lines 14-25).



22. With respect to **claim 20**, Vig teaches the device is formed using a micro-fabrication process (col. 5, lines 25-35).

23. With respect to **claim 23**, Vig teaches, or in the alternative as modified above, all of the limitations of claims 1, as explained above. Vig further teaches having an array of thermal sensors, inherently creating a thermal imaging camera (col. 5, lines 14-25). In the alternative, if it is held that Vig does not inherently teach the array of thermal sensors form a thermal imaging camera it is well known in the art to use an array of thermal sensors in a thermal imaging camera as the sensing surface. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the array of thermal sensors, as taught by Vig, in a thermal imaging camera, as is known in the art, as a person with ordinary skill has good reason to pursue the known options within his/her technical grasp.

24. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Vig as applied to claims 1-2 and 4 above, and further in view of McGlade, Stuart (US 4,806,760), hereinafter referred to as McGlade, and Biernacki, John (US 6,236,145), hereinafter referred to as Biernacki.

Vig, or in the alternative as modified above, teaches all of the limitations of claims 1-2 and 4, as explained above. Vig does not explicitly teach the at least one leg

comprises conductive material arranged to provide an electrical connection between the suspended portion and the underlying substrate.

However, it is known in the art to use electrical signals as the communication signal in response to resonance as shown in McGlade (col. 2, lines 21-27). It is known in the art to have at least one leg comprising conductive material arranged to provide an electrical connection between the suspended portion and the underlying substrate as is shown by Biernacki (Abstract). Therefore, it would have been obvious to one of ordinary skill at the time the invention was made to have the at least one leg, as taught by Vig, comprise conductive material arranged to provide an electrical connection between the suspended portion and the underlying substrate, as taught by Biernacki and McGlade, in order to provide a communication path for signals in response to resonance, as a person with ordinary skill has good reason to pursue the known options within his/her technical grasp.

25. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Vig as applied to claim 1 above, and further in view of Ishizuya et al. (US 2002/0036265), hereinafter referred to as Ishizuya.

Vig teaches, or in the alternative as modified above, all of the limitations of claim 1, as explained above. Vig does not explicitly teach the supporting frame comprises a layer of infrared absorbent material. However, it is a known design choice in the radiation detector art to have the support structure comprise infrared absorbent material, as shown in [0256] lines 11-12 of Ishizuya. Therefore, it would have been

Art Unit: 2884

obvious to one of ordinary skill in the art at the time the invention was made to have the supporting frame, as taught by Vig, comprise a layer of infrared absorbent material, as is known in the art and taught by Ishizuya, as a person with ordinary skill has good reason to pursue the known options within his/her technical grasp.

26. **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over Vig as applied to claim 1 above, and further in view of Paros, Jerome (US 4,459,042), hereinafter referred to as Paros.

Vig teaches, or in the alternative as modified above, all of the limitations of claim 1, as explained above. Vig does not explicitly teach the resonator element and the supporting frame have different coefficients of thermal expansion. However, it is known in the thermal detector art to choose the materials of the resonator and support structure such that the resonator element and the supporting frame have different coefficients of thermal expansion, as shown in col. 2, lines 48-54 of Paros. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to the resonator element and the supporting frame, as taught by Vig, have different coefficients of thermal expansion, as is known in the art and taught by Paros, as a person with ordinary skill has good reason to pursue the known options within his/her technical grasp.

27. Claims 15 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vig.

28. With respect to **claim 15**, Vig teaches, or in the alternative as modified above, all of the limitations of claim 1, as explained above. Vig does not explicitly teach at least one of the supporting frame and resonator element comprise a shape memory alloy. However, it is known in the detector art to have the resonator element comprise a shape memory alloy, for the benefit of decreasing permanent deformation and increasing the lifetime of the detector. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the resonator element, as taught by Vig, to comprise a shape memory alloy, as is known in the art, for the benefit of decreasing permanent deformation and increasing the lifetime of the detector.

29. With respect to **claim 21**, Vig teaches, or in the alternative as modified above, all the limitations of claim 1, as explained above. Vig does not explicitly teach including readout electronics. However, it is well known in the detector art to include readout electronics for the benefit of creating an image. Therefore, it would have been obvious to one of ordinary skill at the time the invention was made to include readout electronics for the benefit of creating an image.

30. With respect to **claim 22**, Vig, as modified above, teaches all of the limitations of claim 1 and 21, as explained above, but is silent on the orientation of the readout electronics with respect to the resonator element or supporting frame. However, it is known in the art to integrate readout electronics with detectors for the benefit of

increasing the resolution of the device, because the pixels are able to be more densely packed into the same area. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vertically integrate for the benefit of increasing the resolution of the array.

31. **Claim 18** is rejected under 35 U.S.C. 103(a) as being unpatentable over Vig as applied to claims 1 and 16 above, and further in view of McGlade (US 4,806,760).

Vig teaches, or in the alternative as modified above, all of the limitations of claims 1 and 16, as explained above. Vig does not explicitly teach each detection element is arranged to output an electrical signal that is indicative of the resonant frequency of the associated resonator element.

However, it is known in the art to use electrical signals as the communication signal in response to resonation as shown in McGlade (col. 2, lines 21-27). Also, it is known in the imaging art to have a separate signal for each detecting element for the benefit of increasing resolution.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have each detection element, as taught by Vig, is arranged to output an electrical signal that is indicative of the resonant frequency of the associated resonator element, as is known in the art and taught by McGlade, for the benefit of increasing resolution and a person with ordinary skill has good reason to pursue the known options within his/her technical grasp.

***Conclusion***

32. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CAROLYN IGYARTO whose telephone number is (571)270-1286. The examiner can normally be reached on Monday - Thursday, 7:30 A.M. to 5 P.M. E.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2884

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CI

/David P. Porta/  
Supervisory Patent Examiner, Art Unit 2884